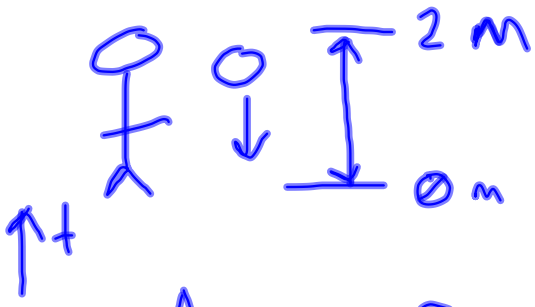
Jason drops a volleyball from 2.0 m above the floor. How long will it take before the ball hits the ground?



$\Delta y = -2\ m$

$a_g = -9.8\ m/s^2$

$t = ?$

$V_i = 0\ m/s$

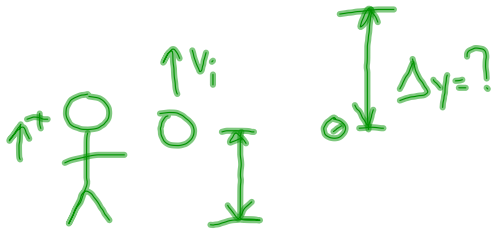
$\Delta y = \cancel{V_i t}^{0} + \frac{1}{2} a_g t^2$

$t = \sqrt{\frac{2\Delta y}{a_g}}$

$= .645$

Free-Fall Practice Problems 1st Block 8.30.11

Jason then hits the volleyball so that it moves with an initial velocity of 6.0 m/s straight up.
- What is the maximum height that the ball reaches?
- How long does it take to reach the maximum height?
- How long does it take for the ball to reach the floor?



$v_i = 6\ m/s$

$a_g = -9.8\ m/s^2$

A) $v_f^{\,0} = v_i^2 + 2a_g\Delta y$

$\Delta y = \dfrac{-v_i^2}{2a_g}$

$= \dfrac{-(6\ m/s)^2}{2(-9.8\ m/s^2)}$

$= 1.84\ m$

B) $v_f^{\,0} = v_i + a_g t$

$t = \dfrac{-v_i}{a_g}$

$= \dfrac{-(6\ m/s)}{(-9.8\ m/s^2)}$

$= 0.61\ s$

C) total time = time of rising + time of fall

$= .61\ s + .881\ s$

$= 1.49\ s$

$\Delta y = v_i^{\,0} t + \frac{1}{2} a_g t^2$

$t = \sqrt{\dfrac{2\Delta y}{a_g}}$

$= \sqrt{\dfrac{2(-3.84\ m)}{(-9.8\ m/s^2)}}$

$= 0.881\ s$

HW: p. 64: 1 – 3

Finish Lab Reports

A coin is tossed vertically upward.
- What happens to its velocity while it is in the air? Draw a position v. time graph and velocity v. time graph to verify.
- Does its acceleration increase, decrease, or remain constant while it is in the air?

A small first-aid kit is dropped by a rock climber who is descending steadily at 1.3 m/s. After 2.5 s, what is the velocity of the first-aid kit, and how far is the kit below the climber?